

## Literature for the MPT Workshop

### Overview of MPT applications:

Erdfelder, E., Auer, T.-S., Hilbig, B. E., Assfalg, A., Moshagen, M., & Nadarevic, L. (2009). Multinomial processing tree models: A review of the literature. *Zeitschrift Für Psychologie / Journal of Psychology*, 217, 108–124. <https://doi.org/10.1027/0044-3409.217.3.108>

### Idea of “Cognitive Psychometrics”:

Batchelder, W. H. (1998). Multinomial processing tree models and psychological assessment. *Psychological Assessment*, 10, 331–344. <https://doi.org/10.1037/1040-3590.10.4.331>

### Introduction to hierarchical modeling and TreeBUGS:

Heck, D. W., Arnold, N. R., & Arnold, D. (2018). TreeBUGS: An R package for hierarchical multinomial-processing-tree modeling. *Behavior Research Methods*, 50, 264–284. <https://doi.org/10.3758/s13428-017-0869-7>

### MPT and mixture modeling of continuous variables (only the first seven pages: p. 1440-1446)

Heck, D. W., & Erdfelder, E. (2016). Extending multinomial processing tree models to measure the relative speed of cognitive processes. *Psychonomic Bulletin & Review*, 23, 1440–1465. <https://doi.org/10.3758/s13423-016-1025-6>

## More Literature on MPT Modeling

The following list provides an (incomplete) overview of further literature about MPT modeling. These papers might serve as a reference and knowledge base after the workshop when working with MPT models in practice.

### Basics and Reviews

Batchelder, W. H., & Riefer, D. M. (1990). Multinomial processing models of source monitoring. *Psychological Review*, 97, 548–564. <https://doi.org/10.1037/0033-295X.97.4.548>

Hu, X., & Batchelder, W. H. (1994). The statistical analysis of general processing tree models with the EM algorithm. *Psychometrika*, 59, 21–47. <https://doi.org/10.1007/bf02294263>

- Hütter, M., & Klauer, K. C. (2016). Applying processing trees in social psychology. *European Review of Social Psychology*, 27, 116–159. <https://doi.org/10.1080/10463283.2016.1212966>
- Moshagen, M. (2010). multiTree: A computer program for the analysis of multinomial processing tree models. *Behavior Research Methods*, 42, 42–54. <https://doi.org/10.3758/BRM.42.1.42>
- Riefer, D. M., & Batchelder, W. H. (1988). Multinomial modeling and the measurement of cognitive-processes. *Psychological Review*, 95, 318–339. <https://doi.org/10.1037/0033-295X.95.3.318>
- Singmann, H., & Kellen, D. (2013). MPTinR: Analysis of multinomial processing tree models in R. *Behavior Research Methods*, 45, 560–575. <https://doi.org/10.3758/s13428-012-0259-0>

### **Order Constraints and Model Selection**

- Heck, D. W., Moshagen, M., & Erdfelder, E. (2014). Model selection by minimum description length: Lower-bound sample sizes for the Fisher information approximation. *Journal of Mathematical Psychology*, 60, 29–34. <https://doi.org/10.1016/j.jmp.2014.06.002>
- Heck, D. W., & Wagenmakers, E.-J. (2016). Adjusted priors for Bayes factors involving reparameterized order constraints. *Journal of Mathematical Psychology*, 73, 110–116. <https://doi.org/10.1016/j.jmp.2016.05.004>
- Klauer, K. C., & Kellen, D. (2015). The flexibility of models of recognition memory: The case of confidence ratings. *Journal of Mathematical Psychology*, 67, 8–25. <https://doi.org/10.1016/j.jmp.2015.05.002>
- Klauer, K. C., Singmann, H., & Kellen, D. (2015). Parametric order constraints in multinomial processing tree models: An extension of Knapp and Batchelder (2004). *Journal of Mathematical Psychology*, 64, 1–7. <https://doi.org/10.1016/j.jmp.2014.11.001>
- Knapp, B. R., & Batchelder, W. H. (2004). Representing parametric order constraints in multi-trial applications of multinomial processing tree models. *Journal of Mathematical Psychology*, 48, 215–229. <https://doi.org/10.1016/j.jmp.2004.03.002>
- Wu, H., Myung, J. I., & Batchelder, W. H. (2010). Minimum description length model selection of multinomial processing tree models. *Psychonomic Bulletin & Review*, 17, 275–286. <https://doi.org/10.3758/PBR.17.3.275>

### **Substantive Application (IAT)**

- Conrey, F. R., Sherman, J. W., Gawronski, B., Hugenberg, K., & Groom, C. J. (2005). Separating multiple processes in implicit social cognition: The quad model of implicit task performance. *Journal of Personality and Social Psychology*, 89, 469–487. <https://doi.org/10.1037/0022-3514.89.4.469>

Meissner, F., & Rothermund, K. (2013). Estimating the contributions of associations and recoding in the Implicit Association Test: The ReAL model for the IAT. *Journal of Personality and Social Psychology*, 104, 45–69. <https://doi.org/10.1037/a0030734>

Meissner, F., & Rothermund, K. (2015). A thousand words are worth more than a picture? The effects of stimulus modality on the implicit association test. *Social Psychological and Personality Science*, 6, 740–748. <https://doi.org/10.1177/1948550615580381>

## **Hierarchical MPT Modeling**

Klauer, K. C. (2006). Hierarchical multinomial processing tree models: A latent-class approach. *Psychometrika*, 71, 7–31. <https://doi.org/10.1007/s11336-004-1188-3>

Klauer, K. C. (2010). Hierarchical multinomial processing tree models: A latent-trait approach. *Psychometrika*, 75, 70–98. <https://doi.org/10.1007/s11336-009-9141-0>

Matzke, D., & Wagenmakers, E.-J. (2009). Psychological interpretation of the ex-Gaussian and shifted Wald parameters: A diffusion model analysis. *Psychonomic Bulletin & Review*, 16, 798–817. <https://doi.org/10.3758/pbr.16.5.798>

Smith, J. B., & Batchelder, W. H. (2010). Beta-MPT: Multinomial processing tree models for addressing individual differences. *Journal of Mathematical Psychology*, 54, 167–183. <https://doi.org/10.1016/j.jmp.2009.06.007>

Stahl, C., & Klauer, K. C. (2006). HMMTree: A computer program for latent-class hierarchical multinomial processing tree models. *Behavior Research Methods*, 39, 267–273. <https://doi.org/10.3758/BF03193157>

## **Response times and continuous variables**

Heck, D. W., & Erdfelder, E. (2017). Linking process and measurement models of recognition-based decisions. *Psychological Review*, 124, 442–471. <https://doi.org/10.1037/rev0000063>

Heck, D. W., Erdfelder, E., & Kieslich, P. J. (in press). Generalized processing tree models: Jointly modeling discrete and continuous variables. *Psychometrika*. <https://doi.org/10.1007/s11336-018-9622-0>

Klauer, K. C., & Kellen, D. (2018). RT-MPTs: Process models for response-time distributions based on multinomial processing trees with applications to recognition memory. *Journal of Mathematical Psychology*, 82, 111–130. <https://doi.org/10.1016/j.jmp.2017.12.003>

Schweickert, R., & Zheng, X. (2018). Tree inference: Selective influence in multinomial processing trees with supplementary measures such as response time. *Journal of Mathematical Psychology*, 86, 10–29. <https://doi.org/10.1016/j.jmp.2018.07.001>